THE EFFECT OF A LABYRINTH EXPERIENCE AND SETTING ON ATTENTION, AFFECT, AND TRANQUILITY, AMONG GARDEN STAFF

by

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STATEMENT OF THESIS APPROVAL

The following faculty members served as the supervisory committee chair and members for the thesis of Katie Gomm.

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ABSTRACT

At some point, people may face an experience that causes sensory overload, mental fatigue, or stress from living in an urban environment. Recovery from the negative influences of the urban environment, according to Attention Restoration Theory (ART) and Stress Recovery Theory, is based on resting executive attention functioning and positive affect repair. Both theories highlight nature as an environment that is effective in restoring executive attention functioning and positive affect repair.

This study explores the effect that setting and a meditative labyrinth experience has on affect, tranquility, and executive attention functioning. The study placed 60 participants into four treatments to explore these relationships, a labyrinth in an urban setting without meditation, a labyrinth in an urban setting with meditation, a labyrinth in a natural setting without meditation, and a labyrinth in a natural setting with meditation. After the participants participated in one of the four conditions, they were given a questionnaire to measure affect and tranquility, then an Attention Network Task (ANT). Affect was measured by the Positive Affect and Negative Affect Schedule (PANAS). Tranquility was measured using a tranquility index developed for previous research. The directed attention or executive attention functioning was measured by the attention network task (ANT).

Executive attention functioning was higher for the meditation group rather than the no meditation group. The results also found negative affect was greater in the urban area compared to the natural area. The tranquility results showed meditation depended on setting for an effect. The nature setting with no meditation had the highest effect on tranquility. The urban area with no meditation had the lowest effect on tranquility.

The results from this study are important because it gives direction for experiences that may enhance recovery from attentional fatigue and positive affect repair. The study also gives implications for urban dwellers who may find meditation is the best experience for executive attention recovery in an urban environment. However, for urban dwellers who want to improve their affect and sense of tranquility, they may find spending time in nature will be more effective. This study gives reason for future research to study the recovery of attentional fatigue and positive affect when a restorative experience is meditation in nature compared to meditation in an urban environment.

I dedicate this to my mom, Shirley, whose support and example have meant the world to me.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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CHAPTER I

INTRODUCTION

Executive attention functioning, positive affect, and a state of tranquility lead to components of well-being and being able to manage life. One part of attentional networking is executive functioning. When individuals have control over executive functioning, they have control over the part of attention that fosters a clear head, open mindedness, creativity, resiliency, stress recovery, flexible problem solving, and decision making (Berman et al., 2008; Isen, 2001). A positive affect is important because research has shown a link to positive affect and success in three main areas of life: work, relationships, and health (Lyubomirsky, King, & Diener, 2005). A positive affect leads to success in these areas by playing a role in an individual's energy, likability, coping behaviors, and prosocial behavior. A tranquil state is a feeling that brings peace of mind, a sense of calm, or serenity. Tranquility is sought to bring individuals happiness and pleasure by creating a mind free of desire, by using no cognitive effort. A tranquil mind allows individuals to regain control over their attentional network by resting the mind.

The management of executive functioning is an individual's mental process that solves problems, plans, completes tasks, pays attention, uses working memory, and

reasoning. These mental processes are used and needed in everyday life for a variety of purposes. If individuals have poor executive functioning, they have a hard time planning projects, comprehending how much time a task will take, retaining information, paying attention, and using memorization. If an individual's executive functioning is working properly, they are better able to achieve academic and personal success (Kaplan & Berman, 2010).

The American Psychological Association's (2012) Stress in America report is filled with reasons for why American's need to find better solutions for managing life. The report found that many Americans are suffering from affective states associated with a negative affect, such as irritability, anger, fatigue, anxiety, sadness, or depression. Younger generations reported experiencing these same states at a higher rate than for adults. The same study found that Americans who are suffering from symptoms of fatigue have higher rates of physical ailments, are obese, lay awake at night, eat unhealthy, and lack motivation. On the other hand, Americans who reported having traits associated with a positive affective state, worried less, felt happier, and exercised more. The report found most people experiencing the affective states associated with negative affect are unsure how to make changes to improve their affect.

One way affect can have a positive influence in life is through achieving a tranquil state. Persons who feel tranquil may have clearer judgment, fall asleep easier, and have the ability to handle daily life efficiently. Without a calm and focused inner self, a person may be focused on negative affective states, such as their fears and worries, which may lead to emotional outburst. It is believed that tranquility can be cultivated within, regardless of the environment, through meditation. However,

restorative environments are also thought of as spaces that cultivate tranquility (Herzog et al. 2011; Ouellette, Kaplan, & Kaplan, 2005) .

There are many theories about what will restore individual's affect, tranquility, and attention. Western medicine is a popular choice; however, Eastern traditions and alternative treatments are becoming more popular. Among alternative treatments are restorative settings and meditation.

Arguably, there are different circumstances in which setting or a meditative labyrinth experience will be preferred and more effective. In an article, Kaplan explains the possible strengths and weaknesses of restorative environments and meditation (Kaplan, 2001). He theorizes that because meditation is a skill that takes practice and time before it makes a difference in improving executive functioning, most people without meditation training will find a restorative environment more effective in improving executive functioning. However, there are many situations in which people do not have access to a restorative environment often enough to restore mental fatigue. In such cases, it may be that a meditative experience is beneficial. Kaplan also explains that tranquility is sought from both meditation and a restorative setting.

The labyrinth experience is unique in that it combines both setting and meditation. Labyrinths can be found in both urban and natural settings. There is no consensus of one particular way to use a labyrinth; however, they are often used for prayer, meditation, and contemplation (Artress, 1995). For this study, a labyrinth experience with no meditation and a labyrinth experience with a mindfulness walking meditation exercise will be used. There is research about the benefits of restorative settings, labyrinth use, and mindfulness meditation, but there is no research exploring

the relationship between restorative settings and meditation. Through the use of a meditative labyrinth experience in a natural and urban setting, this study aims to explore this relationship. The purpose of this study is to examine the relationship of a labyrinth experience and setting on attention, affect, and tranquility in adults (see Figure 1).

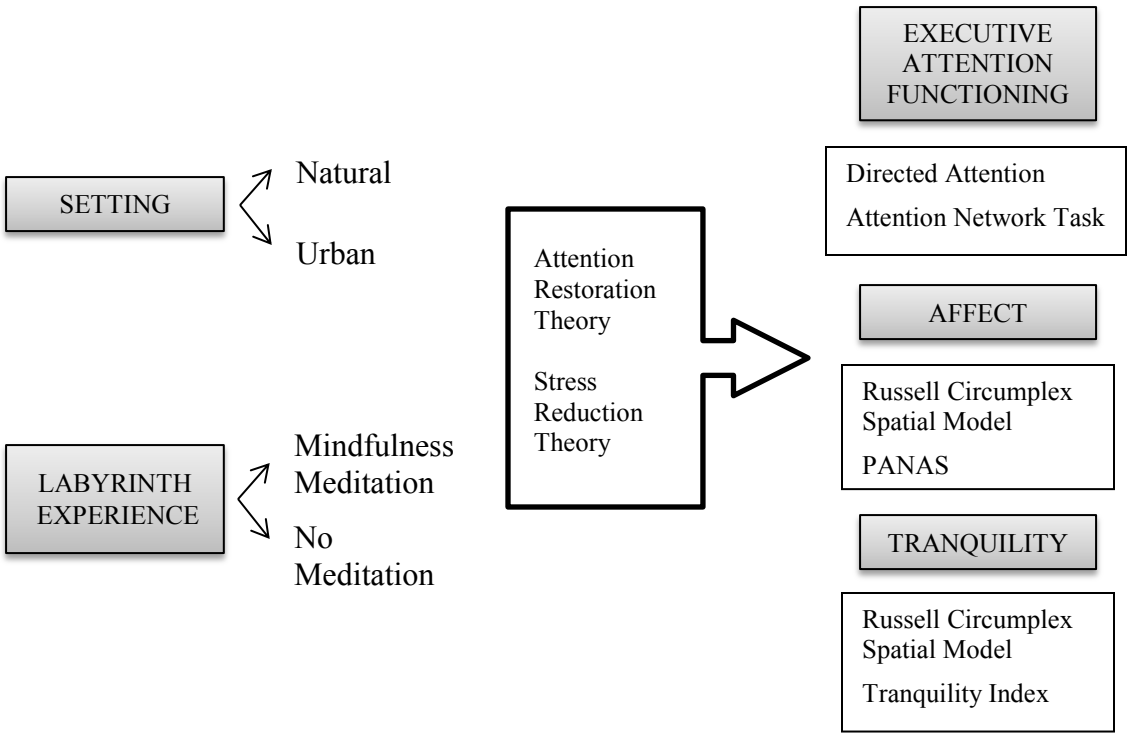


Figure 1 Variables and Theories

CHAPTER II

LITERATURE REVIEW

Restorativeness

The word "restorative" refers to an individual's return of strength, or health, by means of enhancing his/her renewing abilities. The outcomes researchers have used to measure the restorativeness of a place or activity have varied greatly. Some of the researchers have chosen one aspect such as executive functioning or affect, whereas other researchers have combined various physiological and psychological measures of restorativeness.

Executive attention functioning, which is the management of cognitive processes, is often used as a measure in Attention Restoration Theory (ART). ART focuses on the recovery of mental fatigue by being in a restorative environment. The theory has found nature or viewing nature to be an effective restorative environment (Berman et al., 2008; Kaplan & Kaplan, 1989). It hypothesizes a restorative setting can improve executive functioning by capturing involuntary attention, thus allowing directed attention or executive functioning to recover (Kaplan, 1995).

Affect is another popular measure used in previous restorativeness research. Positive and negative affect is explored to determine the affective state an individual is

in. Both natural settings and meditation have been studied to see if they influence affect, and both have been found to repair affective states (Johansson et al., 2011; Sears & Kraus, 2009).

Tranquility is a restorative emotion, sought after by people seeking both restorative environments and meditation. Tranquility helps individuals regain their composure and renew focus in life. If a person is feeling tranquil, they are feeling, peace, calm, and serenity, all feelings that are low arousal but pleasant states and may allow the mind to rest. Little research has been completed on the effects of a restorative setting on tranquility. In some research, tranquility is associated with soft fascination (Kaplan, 2001; Splan, 2011). Soft fascination is an automatic control of the mind, often caused by stimuli; this automation of the mind allows it to rest. A resting mind may be considered a tranquil mind.

Other research has combined psychological or physiological outcomes. A combination used in restorative environment research is attention and affect. These studies found both improved from interactions with nature (Berman et al., 2012; Hartiget al., 2003). Physiological and psychological effects have been tested by Ulrich (1984), who found patients with a view of nature from their room recovered faster physically and had a more positive affect state.

Executive Attention Functioning

Posner and Peterson (1989) explain how the brain works as a system to control voluntary brain functions, this process uses an attentional networking system, which is made up of three cognitive functions: orienting, alerting and executive control. If

individuals become mentally fatigued, it can affect their ability to control the functions that make up the attentional network. Executive control is of particular importance, because it is the function which controls individuals ability to problem solve and engage in conflict resolution. If individuals are able to maintain control over their executive control, or maintain directed attention, they are better able to achieve academic and personal success (Kaplan & Berman, 2010). ART explains one possible solution to mental fatigue.

ART suggests individuals have two types of attention, voluntary and involuntary. Voluntary or directed attention is defined as attention that requires individuals to focus or concentrate on a task. This requires effort. Involuntary attention is defined as attention that is effortless (Kaplan & Kaplan, 1989; Kaplan, 1995). The theory further explains that when individuals sustain voluntary or directed attention for any prolonged period of time they become mentally fatigued. The theory continues to hypothesize that by using involuntary attention, and giving directed attention a break, it can restore directed attention, creating a restorative experience. ART research has studied settings and activities in which this process takes place. The most common setting study is natural environments.

Affect

Affect or the experience of feelings is used as an indicator of restorativeness. Affective states are the feelings people experience in reaction to stimuli; they last longer and are less intense than an emotion. Emotion, in contrast, is more intense and caused

by a specific behavior. To determine the affective state individuals are experiencing, two dimensions of affect, arousal and pleasantness, are sometimes measured.

Different models and scales have been used to explain and measure affect using a combination of reigning affective states. A spatial circumplex model was created to explain how affective states are related to one another; places affect states under two bipolar dimensions (Russell, 1980). On opposing ends are high or low arousal, and high or low pleasure. There are four quadrants in which affective states are placed according to the degree to which arousoual and pleasantness are experienced. Affect is further broken into polar factors of positive or negative affect, based on the affective qualities of the quadrant within which they fall.

The two-factor model of positive and negative affect is often measured using self-reported feelings individuals are experiencing. A common two-factor model, Positive Affect and Negative Affect Schedule (PANAS), uses Russell's (1980) spatial circumplex model as a foundation for determining which affective states are positive and negative (Watson et al., 1989). If an individual is experiencing a positive affective state, the person will identify with positive affect states in the high arousal and high pleasantness quadrant of the circumplex model, for example, enthusiastic, attentive, and alert. If an individual is experiencing a negative affect, they will identify with negative affect states, from the high arousal low pleasantness quadrant of the circumplex model, such as disinterested, ashamed, nervous, irritable, distressed (Russell, 1980; Watson et al., 1989).

Positive Affect

According to Watson and collegues (1989), the high arousal and pleasantness quadrant is associated with highest degree of positive affect. On the other hand, the low arousal and low pleasantness quandrant is associated will the least positive affect. Positive affect is defined as the extent to which one feels enthusiastic, acitve, and alert (Watson et al., 1989). If an individual is experiencing positive affect, the person will identify with and experience positive affective states, for example, happy, aroused, delighted, excited, and glad.

There are many benefits associated with positive affect, such as flourishing, which the research describes as living within an optimal range of human functioning (Fredrickson & Losada, 2005). Positive affect leads to a higher functioning cognition processes, which foster a clear head, open mindedness, creativity, resilience, stress recovery, flexible problem solving, and decision making (Berman et al., 2012). All these skills are needed for optimal daily living. When persons had a high positive affective state, they made wiser choices for consumer goods as well as medical needs (Isen, 2001). Positive affect is a common measure of restorativeness, because of all the well-being with which it is associated.

Negative Affect

The high arouseal and unpleasantness quadrant is associates with the highest degree of negative affect. The low arousal and pleasantness quadrant is the least degree of negative afect. Negative affect is defined as the dimension where one feels distress and unpleasantess (Watson et al., 1989). If individuals are experiencing a negative

affect, they will identify with negative affective states, such as scared, afraid, distressed, tense angry, frustrated, and annoyed (Watson et al., 1989). When these feelings are experienced, they lead to consequences, for example, stress, depression, and poor performance (Berman et al., 2012; Isen, 2001).

Depression has specifically been studied and linked to negative affect. Berman and colleagues (2012) found depressed participants' positive affect was increased after a walk in nature. Geschwind and colleagues (2011) found that when participants tried mindfulness-based cognitive therapy, their positive affect increased and depressive symptoms decreased. Once the depressive symptoms decreased, the participants were more responsive to pleasant daily-life activities. Based on the results of this research, if individuals are to be successful, then it is important the person's positive affect is increased, while negative affect is decreased.

Tranquility

Socrates called tranquility a true form of happiness, because a tranquil mind was free from desire and associated with peace of mind. A tranquil mind is associated with a composed mind, which may allow individuals to have clearer judgment, fall asleep easier, and have the ability to handle daily life efficiently. Without a calm and focused inner-self, individuals may be focused on negative affective states, such as their fears and worries, which may lead to an emotional outburst and physical ailments. On the other hand, when a mind is calm and focused, it is free, giving the mind a chance rest and be clear. Tranquility is then associated with happiness, and feeling a sense of

serenity. Classic philosophy and Buddhism have attempted to explain how individuals achieve tranquility.

Classical philosophy also discusses tranquility as an optimal characteristic to achieve in life. How it is achieved is not agreed on, however. The philosophers attempt to explain what kind of life one would have to lead to experience tranquility. Plato argues virtue is needed to achieve tranquility, that if a man lacks inner harmony, even if desires are fulfilled, efforts at achieving tranquility will be lost. Aristotle taught that tranquility is achieved by living well in addition to virtue. A life with friends, wealth, and power will bring tranquility, the true form of happiness. Epicurus argued that passive pleasure is fundamental to happiness, that intense pleasure is not human being's ultimate goal, but a state of serenity called *ataraxia*. Epicurus described *ataraxia*, as a mind free from distress and worry. Stoics believed tranquility could be achieved through apathy, where despite what is happening in life, by remaining free of feeling, individuals will achieve serenity. This thought of not being attached to feeling or a mindset is similar to Buddhist teaching on tranquility.

Buddha taught how an individual may achieve a tranquil mind and insight through meditation. He taught there are four stages of tranquility. The first is applied thought, sustained thought, happiness, bliss, and equanimity. The second stage is bliss, happiness, and equanimity. The third stage is happiness and equanimity, and the fourth is equanimity. Equanimity is a state of mind that is balanced and pure, which is the trait of a tranquil mind. Once a practitioner reaches equanimity, by the final stage, they have reached a tranquil mind.

Current research has attempted to explain and describe tranquility through describing it as an affective state. Russell and colleagues (1980) place tranquility in the circumplex model under low arousal and high pleasantness. It is associated with other low arousal and high pleasantness affective states such as calmness, contentedness, and serenity. Russell and colleagues (1980) explain that affective states with opposite charges are rare, and therefore may be harder to achieve. Achieving tranquility may be hard to achieve because individuals need to calm their mind, to be in a state of low arousal. With all the stress and stimuli of daily living, this can be hard to achieve.

Tranquility may be achieved in different ways. A tranquil mind does use little cognitive effort and may, therefore, be associated with soft fascination (Kaplan, 2001). Soft fascination allows a mind to reflect. Tranquility is strongly correlated to reflection, which is thought of as an inward process. This may explain why tranquility has been reported no matter the environment (Herzog et al., 2011; Johansson et al., 2011). It is believed that tranquility can be cultivated within regardless of the setting, through meditation. Practitioners of meditation often seek tranquility through meditating. However, various settings are also thought of as tranquil spaces, such as restorative environments. Tranquility may be associated with setting or meditation.

Despite people seeking environments for a tranquil experience, the association between setting and tranquility has been explored very little. There are only a couple studies on the relationship. One such study was not studying tranquility, but the effects of a wilderness experience. Increased feelings of tranquility were reported during a wilderness experience where visitors sought time to be close to nature and to explore the beauty of a wilderness place (Kaplan & Talbot, 1983). In another study of

tranquility, at a Benedictine monastery, users reported experiencing tranquility and interior peacefulness during community prayer and exploring a fascinating place. The Benedictine monastery experience had a mix of meditation and setting influencing a tranquil state (Ouellette et al., 2005).

Setting

Setting has been found to influence an individual's state of mind, affect, and physical health. Previous research compared natural and urban environments using urban spaces without energy or water present, and comparing them to impressive natural landscapes. Although these studies found nature led to recovery, they may have been biased by the use of outstanding natural scenes (Hartig, Mang, & Evans, 1991; Laumann, Garling, & Stormark, 2001). Later studies using more moderate landscapes also found that nature is still more restorative, but with less of a difference (Hartig et al., 2003). Within urban environments, some microrestorative experiences can be found by manipulating the environment to mimic the natural world. This is called Biophilic design. Biophilic design can be created by adding plants to an interior environment or by providing a view of nature.

Natural Setting

The natural setting exists where there is little to no presence of human dominance over nature. Natural landscapes over urban environments have been shown to help individuals recover from mental fatigue and to reduce stress. Further, they do so

better than urban environments (Hartig et al., 2003). For these reasons, there are many examples of persons seeking out natural environments for their restorative capabilities.

There are certain attributes of landscapes people prefer and seek out; these landscapes have also been found to be high in restorative properties. The most preferred natural areas have a clear line of vision or high prospect and few hiding places, such as the edge of a meadow (Gatersleben & Andrews, 2013). Another attribute preferred are landscapes that possess blue space (Kaplan, Kaplan, & Ryan, 1998).

Urban Settings

It is important that opportunities within urban environments offer restorative experiences, because many people do not have time, mobility, or live near access to unmodified natural spaces. These access problems make nearby nature an influential restorative setting. It is not only access, but desire, that plays a role in the amount of time people spend in an urban environment. Even on vacation, youth, adults, and the elderly spent time seeking a restorative experience not just in nature, but within built environments and the home as well (Scopelliti & Giuliani, 2004). This may lead to the conclusion that offering a restorative experience in a variety of settings, not just natural settings, is important.

If urban environments are to offer the same restorativeness as natural environments, the settings and experiences need to demand little directed attention. Research has found that by providing nature with high fascination in an urban environment, directed attention can be restored; however, some urban environments will have a negative effect on affect and attention (Hartig et al., 2003; Kuo & Sullivan,

2001). Urban environments that have a negative effect are often barren, and full of concrete with little to no natural elements. The key to an urban environment being restorative is a well-designed space that incorporates natural elements, blue space, and high fascination or interest (Karmanov & Hamel, 2008).

Understanding what attributes improve attention and affect or which increase negative affect helps designers and planners create healthier cities. Although most research has shown urban areas increase negative affect, some research has also shown urban areas can on some level improve affect and attention if certain attributes are present. One is by bringing nature into an urban setting (Felsten, 2009; Johansson et al., 2011). Nature that is near an individual's home or workplace, and is accessible daily, is called "nearby nature." Nearby nature in the urban setting, even if only just a view, improves well-being (Kaplan, 2001; R. S. Ulrich, 1984). In order for nearby nature to improve well-being, certain conditions need to be present.

If boring and uninteresting landscapes are compared to scenic landscapes, the more scenic landscapes are found to have a more restorative character. The urban environment should imitate the high fascination of nature, but not all restorative urban environments need to mimic pristine or dramatic scenic landscapes. Microrestorative experiences such as everyday backyards, window views, plants, water features, and pictures can make an impact on some level (Kaplan et al., 1998). Students with views of nature, real or murals with blue space, showed improvement in directed attention (Bagot, 2003; Felsten, 2009). In another study, nature in hospital settings improved patient care by decreasing their healing time after surgery (Ulrich, 1984).

Water, or blue space, is another attribute of landscape that offers a microrestorative experience and has a great effect on restorativeness. Present research shows urban settings with water present were rated as high as natural green spaces, such as fields and forest (White et al., 2010). Users of a children's hospital garden were asked to rate the restorative qualities of specific elements found in the garden for patients. Both children and adults rated the fountain and the sound of running water as one of the most important features within the children's garden (Whitehouse et al., 2001). Water is an important element in the urban environment that is restorative. Unlike natural settings, the lack of water present may prevent an urban environment from being restorative.

Meditative Labyrinth Experience

Labyrinths are a tool for creating a healing experience. They are often found in places intended for a therapeutic experience, such as hospitals gardens, hospices, churches, and psychiatric facilities. A common misunderstanding is that a labyrinth is a maze. However, labyrinths differ from mazes, because it has one path in and out. The user winds left then right until they reach the center, then they follow the path back out again. Labyrinths have been around for thousands of years They are found throughout the world and in many different cultures, such as Hopi, Mayan, Greek, Celtic, and Roman (Artress, 1995). Historically, they are found in different patterns on baskets, rock drawings, within in the landscape, inside cathedrals, and part of text. Today, labyrinths can be found in urban locations, such as correction centers, churches,

hospices, hospital campuses, and college campuses. Labyrinths can also be found in wooded areas, beaches, snow, and nature in general.

If labyrinths are within a restorative environment, the additional meditation component often used when using a labyrinth may enhance the labyrinths effect on restorativeness. The kind of meditation used during labyrinths can vary and there is no one right way to use a labyrinth, but many use it as a tool for prayer and meditation.

There are two forms of Buddhist meditation that may be profitably used with a labyrinth, insight (vipasana) and concentration (samatha). This research focuses on mindfulness meditation, which uses a combination of these meditation practices. During mindfulness meditation, the focus is on being instead of doing, on the present, not the past or future. Jon Kabet-Zin (1994) describes mindfulness meditation as a way of a paying attention on purpose, in the present moment, nonjudgmentally. During mindfulness meditation when the mind wanders, thoughts are encountered or acknowledged nonjudgmentally, then focus is returned to the present moment. It can be practiced anyplace at any time, often during activities, such as sitting, standing, lying down, walking, and eating. Researchers have found mindfulness and meditation improve attention and well-being (Davis & Hayes, 2011; Goodman & Schorling, 2012). Mindfulness meditation also improves affect by improving positive affect and decreasing negative affect (Sears & Kraus, 2009). One mindfulness meditation technique used is walking meditation.

Walking meditation is one of the postures of Buddhist meditation. It may be that walking meditation may be easier to practice than other postures such as sitting, lying down, or standing, which require stillness. Walking has been found to be restorative

despite the environment. Within a natural environment, walking has been found to improve cogitation and affect (Berman et al., 2012). On the other hand, walking has been found to improve affect even in an urban environment (Johansson et al., 2011). Labyrinths create an experience that naturally leads to a walking meditation in a variety of settings. It may make learning to meditate easier for those who have not ever participated in meditation.

The length of time needed to become proficient in mindfulness meditation varies. Jon Kabet-Zin explains that while mindfulness may be simple, it is not easy, because it forces individuals to work against habitual unawareness. For this reason, it may not work as a treatment of restorativeness for everyone. The majority of existing research has studied the effect of mindfulness meditation over time and with training. There has been the beginning of researching mindfulness meditation without intense and lengthy training. One study used only 5 days of meditation training, and found an improvement in attention and affect (Tang et al., 2007). Five days is still a longer time frame than is used in restorative environments research.

There is little empirical research studying the restorative effects of labyrinth use; however, a couple studies have been completed. One such study by Sandor and Froman (2006) measured affect during a labyrinth walk. It found an increase in positive affect and a decrease in negative affect. Another study found evidence of positive feelings and improved physical health after 6 weeks of labyrinth use at a corrections facility (Zucker & Sharma, 2012). More research is needed to understand the effect that labyrinth use has on restorative experiences.

Restoration, Setting, and Meditation

Both restorative environments and meditation are sought for restoration, and there are two theories as to why and how they restore affect, tranquility, and attention. ART theorizes that attention processes, specifically executive functions, are improved by nature (Kaplan, 1995). Kaplan also explains how meditation may improve executive functioning as well by giving people the opportunity to rest attention through fascination. On the other hand, Ulrich's (1991) Stress Recovery Theory claims natural areas are a place for reprieve from negative feelings, therefore reducing stress.

Attention Restoration Theory

Nature in particular has been shown to help individuals recover from mental fatigue (Berman et al., 2008; Kaplan & Kaplan, 1989). The reason nature is believed to be high in restorativeness is because it creates an environment that is high in involuntary attention, giving voluntary or directed attention a rest. ART uses four components to determine the restorative value of an environment: being-away, fascination, extent, and compatibility (Kaplan, 1995; Kaplan & Kaplan, 1989).

Being-away can be achieved by creating an environment where individual's thoughts are directed away from the stresses of everyday life. This can be done by physically or conceptually removing an individual's thoughts from their daily routines and concerns. When creating a setting in the urban environment where this can occur, the scenery must be interesting, aesthetic, and different from everyday experiences. Gardens are a good example of settings urban dwellers may escape to. Gardens not only offer a view of nature and interest to the urban landscape, but they are restorative as

well. Gardens can be restorative to people of all ages, offering an escape or retreat from daily life (Gross & Lane, 2007). In addition to individual spaces, gardens are often found in hospital settings to offer patients a place for escape from the stress of illness.

Extent can be achieved by creating opportunities for exploration and mystery. The organic pattern of nature is full of these opportunities. The urban environment can offer extended thoughts past initial perception. Hidden foregrounds, unknown trails, or a courtyard with a Japanese garden can create extent.

Having an interesting and aesthetic environment creates fascination. When comparing the restorativeness of natural settings versus urban settings, the combination of elements that make up the fascination value directly relates to the effect the environment has on restoration. When presented with murals of interesting and grand landscapes or a view of mundane nature with little vegetation, participants found the murals to be more restorative (Felsten, 2009). This shows the importance of fascination. It is not just enough to have nature present; it must also captivate the users. Elements used to create fascination are vegetation, water, and artwork.

A restorative setting should be compatible with individual's goals. There may be times where an environment is considered restorative or not based on its use. For example, if a restorative space is being used for violent purposes, it may not be restorative. If a normally nonrestorative space is being used for meditation or religious purposes, it may be restorative. Individual preferences determine the value of a place.

Stress Recovery Theory

Ulrich's (1991) Stress Recovery Theory claims natural areas where individuals feel safe are settings for reprieve from negative feelings, while urban areas create feelings of stress. Stress reduction theory argues that humans need to have a break from stress. This, in turn, creates a restorative response. Such settings should have visual preference qualities and elicit low levels of fear and arousal. The theory focuses on emotional and physical measures of stress reduction. The stress recovery happens through instant emotional responses, taking only minutes. Ulrich does not believe this is due to a cognitive response, but that nature creates instantaneous emotional responses associated with stress reduction. Stress reduction theory hypothesizes that natural areas may have lower levels of complexity, therefore allowing levels of arousal to be lower, allowing recovery from stress. It also argues that nature reduces stress because humans have adapted a connection to nature, but adaptation to the urban environment has not evolved.

Ulrich and colleagues (1991) tested the stress recovery theory with 120 stressed people who were given six different tapes to assist in recovery. The tapes were a combination of nature or urban scenes. The recovery from stress was faster and more complete when the individual viewed the tape with nature.

Conclusion

Hopefully, this study will improve the understanding of the relationship between meditation and setting on affect, tranquility, and attention. Understanding this will help people know when and where a restorative environment is the best alternative treatment

to cognitive fatigue, negative affect, and an agitated mind, and when meditation is a good option.

The strength of meditation is that it can take place anywhere, but often requires training and time (Davis & Hayes, 2011). However, the strength of a restorative environment is that recovery takes place at a subconscious level. The participant does not need any special training. The study should help us understand if meditation makes a suitable substitute for a restorative environment when individuals cannot gain access to one, or if the combination of setting and meditation will have more desirable effect. Kaplan (2001) explores these relationship and hypothesizes that together they will strengthen restorativeness.

Providing an accessible restorative experience for urban dwellers to go to recover and improve their well-being may be achieved through labyrinth use. Understanding the role labyrinths play in attention restoration and well-being may help designers and health professionals understand in what context labyrinths might be profitably used. It may help explain why for centuries labyrinths have been used for prayer and meditation.

To compare and explore the relationship between a labyrinth experience of walking meditation or no meditation and a natural or built setting, this study will invite participants to walk a labyrinth under four different conditions, which manipulate meditation and the setting. This study may find an interaction between the two variables, which would bring more understanding to the strengths and limitation of both meditation and restorative environments.

Hypothesis

This study hypothesizes that there will be interactions between setting and labyrinth experience.

The objectives are (1) to examine the effect of setting and labyrinth experience on attentional functioning, (2) to examine the effect of setting and labyrinth experience on affective sates, and (3) to examine the effect of setting and labyrinth effect of experience on tranquility. In order to achieve the objectives, the following hypotheses will be tested. Although this study places primacy on interaction hypotheses, should the interactions be nonsignificant, main effect hypotheses will be tested.

Interaction Hypothesis 1: There will be a significant interaction between setting and labyrinth experience on executive attention functioning. The interaction will be such that executive attention functioning scores will be higher for those exposed to the nature condition than for those exposed to the urban condition, but the effect will be stronger for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Main Effect Hypothesis 1a: Executive attention functioning scores will be higher for those exposed to the nature condition than for those exposed to the urban condition.

Main Effect Hypothesis 1b: Executive attention functioning scores will be higher for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Interaction Hypothesis 2: There will be a significant interaction between setting and labyrinth experience on positive affect. The interaction will be such that positive

affect scores will be higher for those exposed to the nature condition than for those exposed to the urban condition, but the effect will be stronger for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Main Effect Hypothesis 2a: Positive affect scores will be higher for those exposed to the nature condition than for those exposed to the urban condition.

Main Effect Hypothesis 2b: Positive affect scores will be higher for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Interaction Hypothesis 3: There will be a significant interaction between setting and labyrinth experience on negative affect. The interaction will be such that negative affect scores will be lower for those exposed to the nature condition than for those exposed to the urban condition, but the effect will be stronger for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Main Effect Hypotheses 3a: Negative affect scores will be lower for those exposed to the nature condition than for those exposed to the urban condition.

Main Effect Hypothesis 3b: Negative affect scores will be lower for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Interaction Hypothesis 4: There will be a significant interaction between setting and labyrinth experience on tranquility. The interaction will be such that tranquility scores will be higher for those exposed to the nature condition than for those exposed to the urban condition, but the effect will be stronger for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

Main Effect Hypothesis 4a: Tranquility scores will be higher for those exposed to the nature condition than for those exposed to the urban condition.

Main Effect Hypothesis 4b: Tranquility scores will be higher for those exposed to the meditation condition than for those exposed to the nonmeditation condition.

CHAPTER III

METHODS

The purpose of this study is to explore the effects of setting and labyrinth use on attentional functioning, affect, and tranquility. This section will describe the procedures used to explore these relationships. This includes who the participants were, the measurements, materials used, and the data analysis process used.

Data Collection Sample

An email describing the study was used to recruit the 60 participants who were employed at Red Butte Garden and Arboretum. All participants were 18 years of age or older. No participants were excluded because of age gender or other demographic factors. Once participants were signed up to participate, they were randomly assigned in to one of the four treatments. Each participant was given a consent form (Appendix A).

Measurement

At the end of the labyrinth experience, both groups were directed to a nearby building to complete measures of the four dependent variables, executive attention functioning, positive affect, negative affect, and tranquility on a computer. A

questionnaire with demographic questions, affect, and tranquility scales was given, and lastly the participants participated in an attention network task exercise. These items measured executive attention functioning, affect, and tranquility.

To measure attention, specifically executive functioning, an attention network task (ANT) was used (Fan et al., 2002). The ANT measures alerting, orienting, and executive functioning, with a 30-minute test that can be easily performed on the computer. The ANT asks participants to determine whether an arrow points left or right. The arrow moves and is sometimes accompanied by flankers. The overall mean response time and the mean response time based on congruent and incongruent flankers were used to determine an overall score for executive attention functioning. There are no current validity assessments for the ANT. The ANT can be found at: https://www.sacklerinstitute.org/cornell/assays_and_tools/ant/jin.fan/.

A psychometric instrument was used to measure affect. It was the Positive Affect and Negative Affect Scale (PANAS) (Watson et al., 1989). The PANAS contains a list of 20 adjectives that measure two kinds of affect, positive feelings, such as joy or pleasure, and negative feelings, such as anxiety or sadness. The measure uses a five-item Likert scale. The PANAS uses the Likert scale to ask participants at which level the participant feels using terms from very slightly or not at all, to extremely. The scale also determines a certain time the terms are being felt by the participants. The scale can ask how a participant feels at that or moment in the past in the last few weeks, year, or in general. This study asked participants how they felt right now. The PANAS is reported to be a reliable and valid the scale. The PANAS was administered on the computer. There are 10 adjectives associated with positive affect and 10 adjectives

associated with negative affect for a total of 20 adjectives. The scores are broken up to determine positive and negative affect separately.

The positive affect scores were first analyzed for reliability. Cronbach's Alpha was .878 for the positive affect scale. The range of interitem correlation was .079 to .652. The corrected item-total correlation ranged from .427 to .775. The scale was found to be reliable. A composite average was used to create a positive affect score.

Secondly, the negative affect scores were first analyzed for reliability. Cronbach's Alpha was .859 for the negative affect scale. The range of interitem correlations was from .218 to .826. The corrected item total correlation ranges were from .398 to .829. The negative affect scale was found to be reliable and a composite average was computed to create a negative affect variable.

Tranquility was measured using Splan's (2011) tranquility index, which consist of six adjectives describing tranquility affective states (see Appendix C). The tranquility phrases were created from terms falling in the pleasant and low activation quadrant of Russell's (1980) circumplex model. The measure used participants self-reported scores from their feelings during the labyrinth experience using a seven-item Likert scale from extremely disagree, to extremely agree. There is no validity assessment for the tranquility index. This scale was administered on the computer.

The tranquility scores were first analyzed for reliability. Cronbach's Alpha was .945 for the tranquility scale. The range of interitem correlation is .689-.869. The corrected item correlation ranges from .822-.867. The tranquility scale was found to be reliable. A composite average was computed to measure the tranquility variable.

Materials

The same nine circuit Chartes labyrinth painted on a canvas cloth was used for all treatments (Appendix D). The canvas labyrinth was 29 feet in diameter. A laptop in a small building near the setting was used for the measurements.

Procedures

The labyrinth was placed in either a natural or urban setting based on the assignment of the participant. The natural setting was located at Red Butte Garden in the natural area of the garden. The labyrinth was set up at the edge of a meadow, within hearing distance of the river. This location was chosen because of the clear line of vision or high prospect and few hiding places, which is a preferred landscape for refuge (Gatersleben & Andrews, 2013). The urban location was located at the entrance of Red Butte Garden Amphitheatre; it had little interesting vegetation nearby and was located near buildings, a street, and parking lot. The setting was very distracting due to pedestrian and car traffic.

The participants were placed in one of four independent variable treatments (Figure 2): an urban or natural setting with or without instructions to meditate. Once a participant arrived at the setting, they were given instructions on how to walk the labyrinth based on whether they should meditate or not (see Appendix B). Only 1 participant walked the labyrinth at a time. Once the participant finished the labyrinth walk, he or she walked to a nearby building and took the online questionnaire and completed the ANT (see Appendix C).

Data Analysis

In the present study, the data analysis was conducted by first entering all data in to IBM SPSS 22. There were no missing data. Data were cleaned and checked for reliability, kurtosis, skewness, and outliers. One consistent outlier who was in the urban no meditation treatment, had scores over 3 standard deviations, across measures; the outlier was removed. After the data were cleaned and ready for analysis, the data were analyzed by performing a descriptive data analysis, demographic analysis, followed by a two-way ANOVA analysis. The main analysis tested the hypotheses using a univariate approach. An interaction between setting and environment was tested first using the two-way ANOVA analysis. If no interaction was found, main effect was tested.

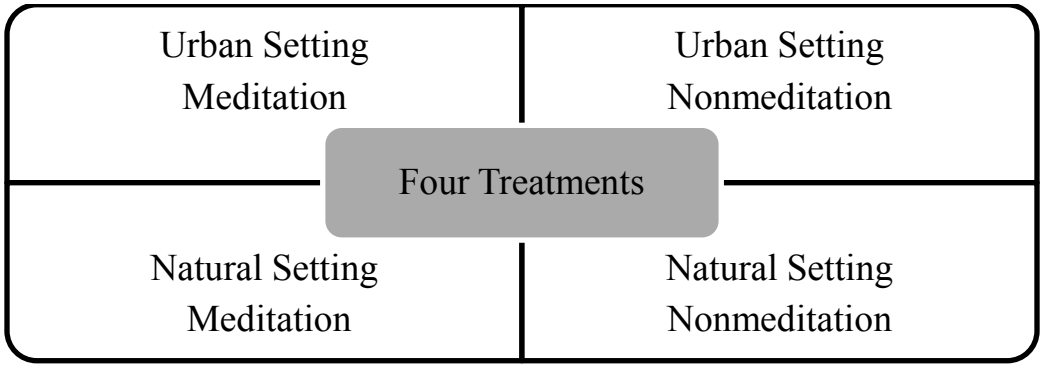


Figure 2 Independent Variable Treatments

CHAPTER IV

RESULTS

The purpose of this study was to examine the effect of a labyrinth experience and setting on executive attention functioning, affect, and tranquility in adults. This chapter will summarize the results for the executive attention functioning, affect, and tranquility measures. After the data were collected, they were cleaned and checked for outliers. One participant was thrown out due to being a repeated and consistent outlier.

Description of the Sample

Of the 60 research participants, 58% were female and 42% were male. All the participants were above the age of 18 years old. Most of the participants had some college and 70% had graduated from college. A high percentage, 80% of participants, spent time in nature recreating. The participants were also asked how often they meditate, 42% never had meditated, but 38% meditated at least weekly. The participants were employees of Red Butte Garden and Arboretum, a botanical garden. Many of the participants worked outside and have daily access to the botanical garden during the work day.

In order to identify associations between the demographic variables (gender, education, meditation practices, and recreation in a nature setting) and the independent

and dependent variables, a series of frequency and ANOVA analyses were conducted. None of the analyses found that any of the variables were significant. The demographic variables were excluded from further analyses.

Descriptive Statistics

The executive attention scores were first analyzed for outliers, but none were found. The ranges of mean scores for executive attention functioning were 38.500 to 65.533. The mean is 55.669 with a standard deviation of 26.058 (see Table 1). The skewness statistic was .275 and the kurtosis was -.481, indicating little skewness and peakedness in the distribution shape.

The positive affect scores were analyzed for outliers; none were found. Positive affect scores ranged from 1.98 to 3.50. The mean for positive affect was 2.87 with a standard deviation of .74 (see Table 2). The positive affect scale skewness statistic indicated a .048 score. The kurtosis statistic was -.418. The scores were acceptable distributions and further analyzed.

The negative affect scores were analyzed for outliers. One participant was deleted because the z score was high. Negative affect scores ranged from 1.05 to 1.30. The mean was 1.154 and the standard deviation was .330 (see Table 3). The skewness and kurtosis statistics indicated a negative skew. To normalize the data, a log10 transformation was completed. After the transformation was completed, the skewness statistic was .314 and the kurtosis is .618.

Tranquility scores were checked for outliers, and none were found. The ranges of mean scores for tranquility were 5.54 to 5.93. The mean was 5.77, and the standard

deviation was 1.09 (see Table 4). The skewness and kurtosis scores indicated a positive skew. To normalize the data, a reflect log transformation was performed. After transformation, the skewness statistic was .173 and the kurtosis was -.357.

Hypothesis Tests

The following section will report results of the study's hypothesis tests. A two-factor ANOVA was used to test each of the study's hypotheses. Interaction hypotheses were tested first, and if an interaction proved to be nonsignificant, it was followed by a test of main effects.

The ANT was used to measure executive attention functioning. The computer network test gave each participant a "conflict" score, which is a score that measures executive attention functioning. A two-way ANOVA was performed to test the hypothesis. The interaction was nonsignificant ($p = .155$). It was hypothesized that there would be an interaction. Once there was found to be no interaction, the main effect was tested. There was a significant meditation main effect ($p = .007$) with mean ANT scores higher in the meditation condition (see Table 5). Meditation had an effect on executive functioning independent of the setting. Setting did not have an effect (see Figure 3). Since previous research has shown nature to improve executive functioning, it was hypothesized that there would be a setting main effect.

The self-reported PANAS was scored 1 to 5. The scores were then broken into positive and negative affect, and a two-way ANOVA was performed on each, separately. The effect of setting and experience on positive affect yielded a non-significant omnibus F ($F = 0.396$, 3/58, $p = .757$), indicating no experimental effects on

positive affect (see Table 6). It was hypothesized that there would be an interaction or main effect on positive affect. These results did not match the hypothesis.

The setting by experience interaction for negative affect was nonsignificant (F = 1.34, 1/58, p = .252). However, there was a significant setting main effect (F = 7.22, 1/58, p = .010), indicating that those in the nature conditions reported lower negative affect than those in the urban conditions (see Table 7) (see Figure 4). This was in the predicted direction. There was no meditation effect. The meditation effect was not in the predicted direction.

The setting by experience interaction was significant for tranquility (F = 5.489, 1/58, p = .023). The interaction plot showed that tranquility was highest in the nature conditions, but the effect was strongest for those in the nonmeditation condition. This was contrary to the hypothesis, which predicted that the effect would be strongest for the meditators. For tranquility, a reflect log transformation was performed to normalize the data. Reflect log transformations flip the direction of the distribution and thus flip the interaction plots. To facilitate interpretation, the interaction plot for tranquility is based on raw scores to preserve the direction of the relations, although the ANOVA was performed on transformed scores (see Table 8) (see Figure 5).

Table 1 Executive Attention Functioning Mean Scores

Setting	Experience	Mean	Std. Error	Lower Bound	Upper Bound
Urban	Meditation	65.533	6.315	52.878	78.189
	No Meditation	38.500	6.537	25.400	51.600
Nature	Meditation	63.643	6.537	50.543	76.743
	No Meditation	55.000	6.114	42.746	67.254
Overall		55.669	3.189	49.278	62.060

Table 2 Positive Affect Mean Scores

Setting	Experience	Mean	Std. Error	Lower Bound	Upper Bound
Urban	Meditation	2.933	0.197	2.539	3.327
	No Meditation	2.821	0.203	2.414	3.229
Nature	Meditation	3.050	0.203	2.642	3.458
	No Meditation	2.769	0.190	2.387	3.150
Overall		2.893	0.099	2.694	3.092

Table 3 Negative Affect Mean Scores

Setting	Experience	Mean	Std. Error	Lower Bound	Upper Bound
Urban	Meditation	0.053	0.017	0.020	0.086
	No Meditation	0.080	0.017	0.047	0.113
Nature	Meditation	0.028	0.017	-0.005	0.061
	No Meditation	0.017	0.015	-0.014	0.048
Overall		0.045	0.008	0.028	0.061

Table 4 Tranquility Mean Scores

Setting	Experience	Mean	Std. Error	Lower Bound	Upper Bound
Urban	Meditation	0.437	0.046	0.345	0.529
	No Meditation	0.338	0.048	0.242	0.433
Nature	Meditation	0.176	0.048	0.081	0.272
	No Meditation	0.295	0.045	0.205	0.384
Overall		0.312	0.023	0.265	0.358

Table 5 Executive Attention Functioning ANOVA

Source	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected Model	6482.502a	3.000	2160.834	3.612	0.019	0.165
Intercept	182280.683	1.000	182280.683	304.720	0.000	0.847
IVSetting	784.631	1.000	784.631	1.312	0.257	0.023
IVExperience	4678.968	1.000	4678.968	7.822	0.007	0.125
IVSetting * IVExperience	1243.309	1.000	1243.309	2.078	0.155	0.036
Error	32900.448	55.000	598.190			
Total	223177.000	59.000				
Corrected Total	39382.949	58.000				

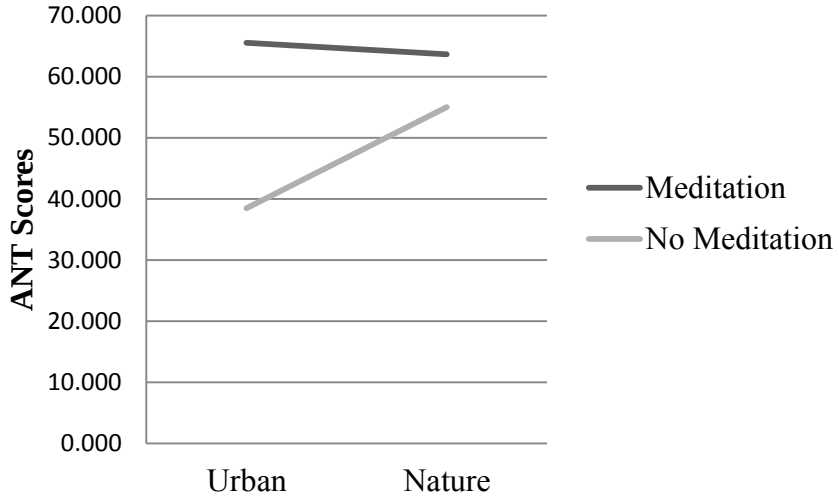


Figure 3 Executive Attention Functioning Means Graph

Table 6 Positive Affect ANOVA

Source	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected Model	.688a	3.000	0.229	0.396	0.757	0.021
Intercept	492.406	1.000	492.406	849.874	0.000	0.939
IVSetting	0.015	1.000	0.015	0.026	0.873	0.000
IVExperience	0.568	1.000	0.568	0.981	0.326	0.018
IVSetting * IVExperience	0.105	1.000	0.105	0.182	0.671	0.003
Error	31.866	55.000	0.579			
Total	525.270	59.000				
Corrected Total	32.554	58.000				

Table 7 Negative Affect ANOVA

Source	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected Model	.034[a]	3.000	0.011	2.969	0.040	0.142
Intercept	0.115	1.000	0.115	29.896	0.000	0.356
IVSetting	0.028	1.000	0.028	7.224	0.010	0.118
IVExperience	0.001	1.000	0.001	0.244	0.623	0.004
IVSetting * IVExperience	0.005	1.000	0.005	1.340	0.252	0.024
Error	0.207	54.000	0.004			
Total	0.352	58.000				
Corrected Total	0.241	57.000				

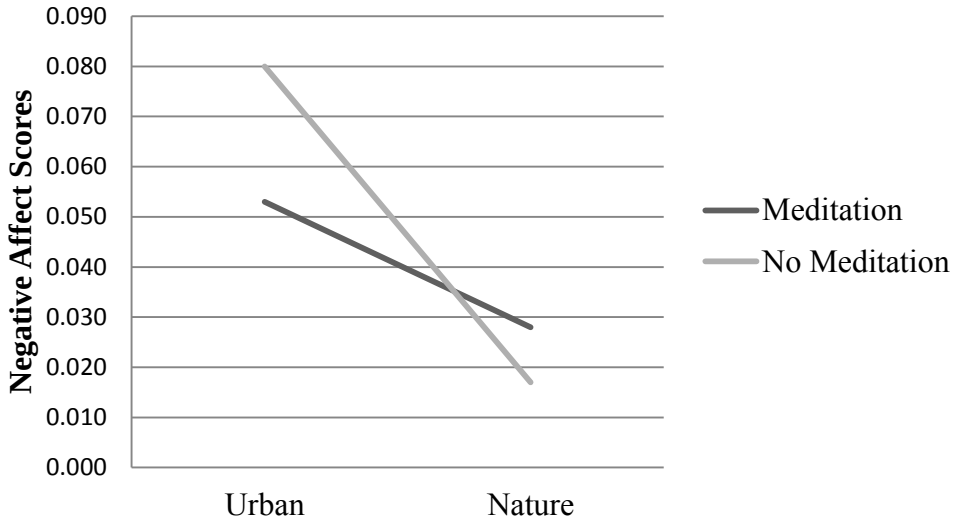


Figure 4 Negative Affect Means Graph

Table 8 Tranquility ANOVA

Source	Type III Sum of Squares	df	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected Model	.507a	3.000	0.169	5.318	0.003	0.225
Intercept	5.709	1.000	5.709	179.735	0.000	0.766
IVSetting	0.340	1.000	0.340	10.691	0.002	0.163
IVExperience	0.001	1.000	0.001	0.042	0.839	0.001
IVSetting * IVExperience	0.174	1.000	0.174	5.489	0.023	0.091
Error	1.747	55.000	0.032			
Total	8.038	59.000				
Corrected Total	2.254	58.000				

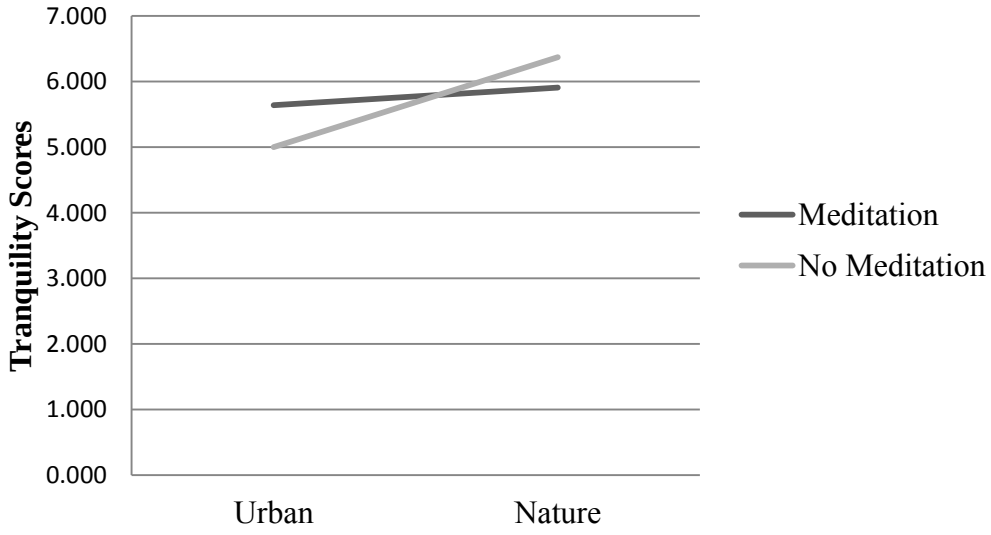


Figure 5 Tranquility Means Graph

CHAPTER V

DISCUSSION

This section is a discussion about the results of the study. A summary of the purpose and results of the study will be given. Secondly, integration with previous research will be examined. Challenges and limitations will be discussed, and then lastly, directions for future research and practice will be discussed.

Summary of Purpose and Results

This study tested the relationship of a meditative labyrinth experience and setting on executive attention functioning, affect, and tranquility. The results found executive attention functioning had a significant effect with the scores higher for the meditation treatment. Executive attention functioning is the only measure that is associated with attention, and meditation had an effect on it.

Contrary to expectations, there was no significant interaction or main effect between setting and meditation on positive affect. This unexpected result can be explained by the nature of the affect terms used in the PANAS. The terms used are placed in high arousal and pleasantness in the circumplex model (Russell, 1980). These terms may be associated with a hard fascination experience and this experience did not have hard

fascination. These terms may not align with the experience of restorative environments with soft fascination such as this study.

Negative affect, the second dimension of affect, was greater in the urban setting compared to the natural setting. This was an expected outcome. There was no meditation effect.

Results showed the effect on tranquility was highest in the nature setting. However, the nonmeditation conditions were higher than the meditation condition, which was contrary to the prediction that meditation would be higher. In the urban condition, tranquility scores were higher in the meditation condition, which was predicted. The unpredicted score of nonmeditation being higher in the natural environment may be explained by the way meditation uses directed attention. The meditation component may have caused the participants to be less affected by the nature, by not allowing participants to rest.

Integration with Previous Research

ART hypothesizes that by allowing directed attention a chance to rest by using involuntary attention, an individual's executive functioning can be restored. Opposite directions of the interaction between meditation and setting on tranquility can best be explained by ART. By adding meditation to the natural experience, it is adding a directed attention task, which takes away from the involuntary attention component needed for restoration according to ART. The participants may have lost the ability to experience nature as they walked the labyrinth by focusing on meditation more. By not

allowing participants to experience involuntary attention, the mind was less tranquil than the participants allowed to rest their directed attention.

Stress recovery theory and ART explain why both affect and tranquility, but not executive attention functioning, were affected by the setting. Stress recovery theory hypothesizes that nature will have an instant effect on emotions and then more complex affective states. It may be that the emotional measures are more easily affected by a short time in nature, leading to the results found in the study. ART hypothesizes that the recovery of executive attention functioning takes longer to be restored, which may be why there was no significant effect from the setting.

Previous research found that even a short bout of meditation can improve attention (Tang et al., 2007). Participants were only walking the labyrinth for a short period of time; however, in both settings, meditation improved attention scores

Limitations

This study suggests that setting had no effect on executive functioning, but the participants do work at the botanical garden. If participants who are not exposed to nature at their place of work on a daily basis were to participate, it may have had a greater effect on results. The consent exposure to nature in the garden may have had an inoculation effect.

Another limiting factor was the location of the measurement test used for the natural area. It was in a building a short walk from the meadow. The walk to the building and the building itself did have urban distractions associated with it. If the

measurements were completed in a more isolated space, for example at the labyrinth setting, there may have been a greater interaction effect on attention.

The amount of time walking the labyrinth may have also been a limiting factor. The time spent walking the labyrinth was short. A longer amount of time spent participating in experience may have improved the result.

Research Implications

This study only explored the relationship between meditation and setting on executive attention function, affect, and tranquility, but did not measure recovery. Future research should explore whether an urban environment with meditation or a nature environment without meditation has the greatest recovery of directed attention and affect repair.

The amount of time spent walking the labyrinth was on average 10- 15 minutes. It may be that spending a longer amount of time in either of the settings or a longer amount of time meditating may have a greater effect on mood or executive functioning. Different results may be found if the effect over time was studied.

Future research may want include tranquility more often as a measure of affect repair. Tranquility may be a better measure of positive affect repair for restorative experiences than positive affect, because the low arousal may be more compatible with the intent of users seeking a restorative experience. The tranquility index may also be more associated soft fascination, which is needed in a restorative experience.

This study showed that nature and no meditation had the highest impact on tranquility. At the same time, there was less negative affect in the nature setting. There

may be an association between lower negative affect and high tranquility in nature. This should be further explored.

The conditions in which the emotional outcomes were significant were separate from the condition in which the cognitive outcomes were significant. Future research could explore if just walking in nature and meditating without a labyrinth would have the same effect.

Implications for Practice

This line of study is crucial to developing our understanding of the dynamics of behavior and environment. Understanding how a setting or activity, such as a labyrinth and meditation, effects affect and attention helps designers and activity program mangers create a restorative experience for people experiencing the negative effects of urban living. The growing body of research suggests a restorative experience can be manufactured.

Offering opportunities to be restored can be useful to employers as an option for them to offer to employees as a way to restore their executive functioning by creating a restorative experience. Existing research also lends to reason that if workers take time to meditate, they will be more productive by using their executive functioning more efficiently from resting their attention. On the other hand, if employees are seeking to achieve a tranquil state of mind, or a low arousal experience, nature is found to be specifically beneficial. In conclusion, this study is important because it provides an exploration into the relationship of meditation and setting on behavior.

APPENDIX A

CONSENT DOCUMENT

Consent Document

for Minimal Risk Research

BACKGROUND

You are being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you want to volunteer to take part in this study.

The purpose of this study is to examine the relationship of settings and labyrinth experience on affect, attention, and tranquility.

STUDY PROCEDURE

It will take you approximately 1 hour to complete this study. As part of this study you will be asked to take part in walking a labyrinth. Afterword, questions will be asked about you and your affect and tranquility. You will also be asked to participate in an attention network task.

RISKS

The risks of this study are minimal. You may feel upset thinking about or talking about personal information related to your affect and tranquility. These risks are similar to those you experience when discussing personal information with others. If you feel upset from this experience, you can tell the researcher, and she will tell you about resources available to help.

BENEFITS

We cannot promise any direct benefit for taking part in this study. However, possible benefits include a restored affect, executive functioning, and tranquility. This experience may teach you a way to relieve stress and fatigue from your daily lives and working.

CONFIDENTIALITY

We will keep all research records that identify you private to the extent allowed by law. Records about you will be kept on computers protected with passwords. Only those who work with this study or are performing their job duties for the University, will be allowed access to your information. .

PERSON TO CONTACT

If you have questions, complaints or concerns about this study, you can contact Katie Gomm at 435-757-9198.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
It is up to you to decide whether to take part in this study. Refusal to participate or the decision to withdraw from this research will involve no penalty or loss of benefits to which you are otherwise entitled. This will not affect your relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS
There are no costs and/or compensation.

CONSENT:
By signing this consent form, I confirm I have read the information in this consent form and have had the opportunity to ask questions. I will be given a signed copy of this consent form. I voluntarily agree to take part in this study

_____
Participant's Name

_____ _____
Participant's Signature Date

_____
Name of Person Obtaining Consent

_____ _____
Signature of Person Obtaining Consent Date

APPENDIX B

MEDITATION SCRIPTS

Process for the Labyrinth Experience without Meditation:

A labyrinth has one path in and one path out. Labyrinths have been used for thousands of years across many cultures as a part of meditation and prayer, today they continue to be built and used around the world by a variety of cultures with different forms of use. There is no one right way to use a labyrinth. For this study, please follow the path to the center of the labyrinth and back out. Please take your time and walk slowly.

Process for the Labyrinth Experience with Meditation:

A labyrinth has one path in and one path out. Labyrinths have been used for thousands of years across many cultures as a part of meditation and prayer, today they continue to be built and used around the world by a variety of cultures with different forms of use. A labyrinth walk has one path in and one path out. There is no one right way to use a labyrinth, but for the purpose of this study I ask that you use walking meditation as you complete the labyrinth. After we go through some walking meditation exercises, please walk to the center of the labyrinth and back out. Please take you time and walk slowly.

We are going to begin with a couple simple Thich Nhat Hanh (1991) breathing 'In-Out' exercises:

Try repeating to yourself as you breathe in, "Breathing in, I know that I am breathing in". Then as you breathe out repeat, "Breathing out, I know that I am breathing out."

Try it once with me (investigator models and repeats with participant),

"Breathing in, I know that I am breathing in"

"Breathing out, I know that I am breathing out."

If you prefer you can recite this this poem,

Breathe in, I calm my body,
Breathing out, I smile,
Dwelling in the present moment,
I know this is a wonderful moment!

No repeat it with me,

Breathe in, I calm my body,
Breathing out, I smile,
Dwelling in the present moment,
I know this is a wonderful moment!

Before you begin walking through the labyrinth we will be coordinating our breathing with our steps. For example, you may want to take three steps with each in-breath, and three steps with each out-breath. If you want you can take two or four steps with each breath. You can also take two in-breath steps and four out-breath steps. Do whatever is comfortable for you. Let us begin by walking and practice matching our breath and our steps. (Investigator begins walking with participant, to the participant find breathe, for a minute.)

Next pay attention to your step and notice how the foot feels lifting, moving forward, putting down, pressing the ground (Investigator models foot). You are now ready to start your labyrinth experience, remember if your thoughts wander you can always return to the breathe exercises. As you experience the labyrinth, be in the present moment and when your mind wanders, just acknowledge your thoughts then gently let go without any judgments. Please take you time and walk slowly

APPENDIX C

ONLINE QUESTIONNAIRE DEMOGRAPHICS, PANAS, AND TRANQUILITY INDEX

Questionnaire

Participant #

Gender M/F

Highest Level of Education Achieved (High School -12 years; Bachelors degree = 16 years, etc.)
Please circle one or write in an answer.

12 13 14 15 16 17 18 Other

How often do you meditate? (Please Circle One)

Daily
Once a week
Once a month
Twice a month
Once a year
Never

What kind of meditation do you practice?

How often do you participate in recreation in nature?

Daily
Once a week
Once a month
Twice a month
Once a year
Never

Circle the number that most closely represented the experience you had when experiencing the Labyrinth:

1 = extremely disagree,
2 = somewhat disagree,
3 = slightly disagree,
4 = neutral,
5 = slightly agree,
6 = somewhat agree
7 = extremely agree

1. I feel calm here.

1 2 3 4 5 6 7
2. I feel relaxed here.
1 2 3 4 5 6 7
3. I feel restful here.
1 2 3 4 5 6 7
4. I feel peaceful here.
1 2 3 4 5 6 7
5. I feel serene here.
1 2 3 4 5 6 7
6. I feel at ease here.
1 2 3 4 5 6 7

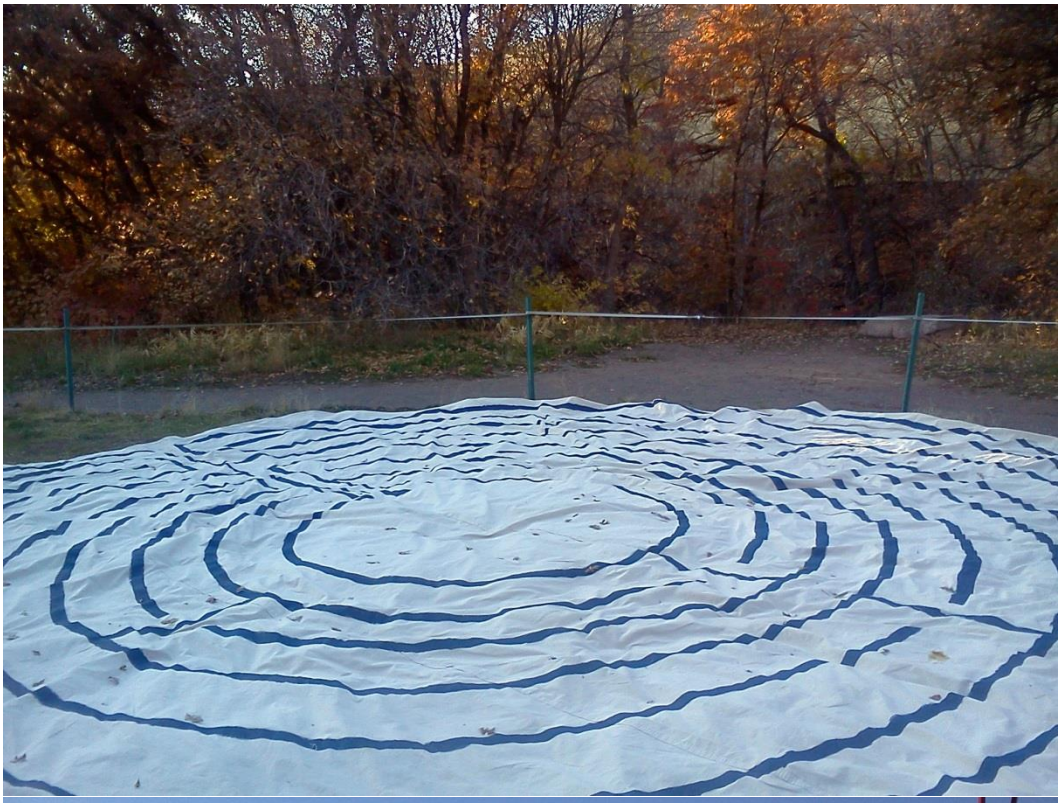
This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers:

1. very slightly or not at all
2. a little
3. moderately
4. quite a bit
5. extremely

_____1. Interested
_____ 2. Distressed
_____ 3. Excited
_____ 4. Upset
_____ 5. Strong
_____ 6. Guilty
_____ 7. Scared
_____ 8. Hostile
_____ 9. Enthusiastic
_____ 10. Proud
_____ 11. Irritable
_____ 12. Alert
_____ 13. Ashamed
_____ 14. Inspired
_____ 15. Nervous
_____ 16. Determined
_____ 17. Attentive
_____ 18. Jittery
_____ 19. Active
_____ 20. Afraid

APPENDIX D

LABYRINTH AND SETTING PICTURES



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